APPENDIX A

"CLEAN" VERSION OF EACH PARAGRAPH/SECTION/CLAIM
37 C.F.R. § 1.121(b)(ii) AND (c)(i)

SPECIFICATION:

Replacement for the paragraph at page 9, line 19 to page 10, line 13:

A semiconductor photo-detector according to the present invention which attains the above object is characterized in that: a first semiconductor layer having a first conduction type, a second semiconductor layer having a second conduction type, and a photo-absorption part comprising a photo-absorption layer sandwiched between the first semiconductor layer and the second semiconductor layer are disposed on a substrate: at least the photo-absorption layer is formed at a position apart inside by a finite length from an end surface of the substrate; the end surface of the second semiconductor layer and the substrate or the end surface of the substrate is provided with a light incident facet angled inwardly as it separates from the surface of the second semiconductor or the surface of the substrate; and light incident to the light incident facet is refracted at the light incident facet and transits the photo-absorption layer diagonally with respect to the layer thickness direction.

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Replacement for the paragraph at page 10, line 14 to page 11, line 14:

Further, a production method of the semiconductor photo-detector according to the present invention which attains the above object is characterized in that: a first semiconductor layer having an intrinsic or a first conduction type, a second semiconductor layer having the same first conduction type, and a growth layer comprising a photo-absorption part including a photo-absorption layer sandwiched between the first semiconductor layer and the second semiconductor layer are disposed on a substrate; a main inside part of the first semiconductor layer at the surface side, or the inside part and part of photo-absorption layer is converted selectively to a second conduction type by diffusion of an impurity; and an end surface of the substrate side growth layer except for the photo-absorption layer or the substrate is provided with a light incident facet angled inwardly as it separates from the surface side from a position apart by a finite length in a direction parallel to the substrate surface with respect to the photo-absorption part comprising the photo-absorption layer, whereby obtaining a semiconductor

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A2 cont. photo-detector in which incident light is refracted at the light incident facet and transits the photo-absorption layer diagonally with respect to the layer thickness direction.

Replacement for the paragraph at page 11, line 15 to page 12, line 15:

Still further, a production method of the semiconductor photo-detector according to the present invention which attains the above object is characterized in that: a first semiconductor layer having an intrinsic or a first conduction type, a second semiconductor layer having the same first conduction type, and a growth layer comprising a photo-absorption part including a photo-absorption layer sandwiched between the first semiconductor layer and the second semiconductor layer are disposed on a substrate; a main inside part of the first semiconductor layer at the surface side, or the inside part and part of photo-absorption layer is converted selectively to a second conduction type by ion implantation and subsequent anneal; an end surface of the substrate side growth layer except for the photo-absorption layer or the substrate is provided with a light incident facet angled inwardly as it separates from the surface side from a position apart by a finite length in a direction parallel to the substrate surface with respect to the photo-absorption part comprising the photo-absorption layer, whereby obtaining a semiconductor photo-detector in which incident light is refracted at the light incident facet and transits the photo-absorption layer diagonally with respect to the layer thickness direction.

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Replacement for the paragraph at page 12, line 16 to page 13, line 15:

Yet further, a semiconductor photo-detector according to the present invention which attains the above object is characterized in that: a first conduction type semiconductor layer, a photo-absorption layer comprising an intrinsic or a first conduction type semiconductor layer, or a superlattice semiconductor layer or a multiple quantum well semiconductor layer, and a schottky electrode are disposed on a substrate; a semiconductor multilayered structure of large schottky-barrier height having a schottky barrier higher in schottky barrier height than the schottky barrier between the photo-absorption layer and the schottky electrode is formed between the photo-absorption layer and the schottky electrode; and an end surface of the substrate side growth layer except for the photo-absorption layer or the substrate is provided with a light incident facet angled inwardly as it separates from the surface side from a position apart by a

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finite length in a direction parallel to the substrate surface with respect to the photo-absorption part comprising the photo-absorption layer, wherein incident light is refracted at the light incident facet and transits the photo-absorption layer diagonally with respect to the layer thickness direction.

A4 cont'

Replacement for the paragraph at page 13, line 16:

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Yet further, a semiconductor photo-detector according to the present invention which attains the above object is provided, wherein the semiconductor layer of large schottky-barrier height is $In_{1-x-y}Ga_xA1_yAs$ ($0 \leq x \leq 1$, $0 \leq y \leq 1$).

Replacement for the paragraph at page 13, line 22 to page 14, line 2:

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Yet further, a semiconductor photo-detector according to the present invention which attains the above object is provided, wherein the semiconductor layer of large schottky-barrier height comprises $In_{1-x-y}Ga_xA1_yAs$ ($0 \leq x \leq 1$, $0 \leq y \leq 1$) and thin $In_{1-u}Ga_uAs_{1-v}P_v$ ($0 \leq x \leq 1$, $0 \leq y \leq 1$) disposed thereon.

Replacement for the paragraph at page 14, line 3:

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Yet further, a semiconductor photo-detector according to the present invention which attains the above object is provided, wherein a compositionally graded or step-graded layer from the same composition as the photo-absorption layer to the same composition as the semiconductor layer of large schottky-barrier height is disposed between the photo-absorption layer and the semiconductor layer of large schottky-barrier height.

Replacement for the paragraph at page 14, line 14:

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The semiconductor photo-detector according to the present invention is characterized in that the light incident facet can be formed very flat and stable as compared with the prior art.

Replacement for the paragraph at page 16, line 8:

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Yet further, a semiconductor photo-detector according to the present invention which attains the above object is characterized in that: a photo-absorption part comprising a

semiconductor multilayer structure including a photo-absorption layer is provided on a substrate, an end surface is provided with a light incident facet angled inwardly as it separates from the surface side, and a V- or U-shaped groove is provided in opposition to the light incident facet, whereby light incident from an optical fiber disposed in the groove is refracted at the light incident facet and transits the photo-absorption layer diagonally with respect to the layer thickness direction.

A9 cont.

Replacement for the paragraph at page 16, line 22 to page 17, line 2:

Yet further, a production method of semiconductor photo-detector according to the present invention which attains the above object is provided, wherein the light incident facet and the V- or U-shaped groove are formed simultaneously by etching.

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Replacement for the paragraph at page 17, line 3:

Yet, further, a semiconductor photo-detector according to the present invention which attains the above object is provided, wherein the light incident facet and its vicinity are buried in an organic substance.

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Replacement for the paragraph at page 17, line 9:

Yet further, production method of semiconductor photo-detection device according to the present invention which attains the above object is fabricated with the light incident facet and its vicinity are buried in an organic substance, and after making optical coupling with an optical waveguide, by removing the organic substance.

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Replacement for the paragraph at page 17, line 16:

Yet further, a production method of semiconductor photo-detection device according to the present invention which attains the above object is characterized in that the light incident facet and its vicinity are buried in an organic substance, and, after making optical coupling with an optical waveguide, space between the semiconductor photo-detector and the optical waveguide is buried in with an organic substance.

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Replacement for the paragraph at page 17, line 25 to page 18, line 4:

A14

In the semiconductor photo-detection device according to the present invention, the device has a groove in opposition to the light incident facet to be a fiber guide for conducting incident light, which part acts as a fiber guide, and high precision positioning is possible only by setting the fiber.

Replacement for the paragraph at page 18, line 23 to page 19, line 11:

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Yet further, a semiconductor photo-detector according to the present invention which attains the above object is characterized in that: a photo-absorption part comprising a semiconductor multilayer structure including a photo-absorption layer is provided on a substrate; an end surface is provided with a light incident facet angled inwardly as it separates from the surface side, the substrate is protruded by a finite length from a tip part of the end surface, and light incident from an optical waveguide, precisely positioned by contacting against the protruded part of the substrate, is refracted at the light incident facet and transits the photo-absorption layer diagonally with respect to the layer thickness direction.

Replacement for the paragraph at page 19, line 12:

A16

Since in the device of the invention described above, part of substrate is protruded by a finite length from the tip of the light incident facet, this part acts as a stopper when a fiber is brought close from a far end in the optical axis direction, and the fiber tip will never contact against the important light incident facet to be damaged.

Replacement for the paragraph at page 19, line 24 to page 20, line 16:

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Yet further, a semiconductor photo-detector according to the present invention which attains the above object is characterized in that: a photo-absorption part comprising a semiconductor multilayer structure including a photo-absorption layer is provided on a substrate; an end surface is provided with a light incident facet angled inwardly as it separates from the surface side, a main reaching area of refracted incident light at the semiconductor layer above the photo-absorption layer is terminated with a substance having a smaller refractive index than the semiconductor layer, incident light is refracted at the light incident facet and transits the photo-

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absorption layer diagonally with respect to the layer thickness direction, and the transit light is total reflected by the substance of small refractive index on the semiconductor layer above the photo-absorption layer.

Replacement for the paragraph at page 20, line 17:

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In the semiconductor photo-detector device of the present invention, a main reaching area of refracted incident light at the semiconductor layer above the photo-absorption layer is terminated with a substance having a smaller refractive index than the semiconductor layer, light is completely total reflected on the upper surface, the refracted light transits two times the photo-absorption layer, and the effective absorption length is increased to two times.

Replacement for the paragraph at page 21, line 8:

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A semiconductor photo-detection device according to the present invention which attains the above object is characterized by comprising a refraction type semiconductor photo-detector comprising a photo-absorption part including a semiconductor multilayer structure including a photo-absorption layer disposed on a substrate and an end surface provided with a light incident facet angle inwardly as it separates from the surface side, and an optical waveguide disposed in opposition to the device; space between the refraction type semiconductor photo-detection device and the optical waveguide is buried in a solid or liquid; whereby light incident to the light incident facet of the photo-detection device from the optical waveguide is refracted at the light incident facet with respect tot he layer thickness direction.

Replacement for the paragraph at page 21, line 26 to page 22, line 13:

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Since in the semiconductor photo-detection device of the present invention, space between the refraction type semiconductor photo-detector and the optical waveguide is buried in a solid or liquid having a refractive index of greater than 1, by appropriately selecting the solid or liquid used to change the refractive index, it is possible to change the refraction angle on the photo-detector incident facet even when using a refraction type semiconductor photo-detector cut from the same wafer having the same layer structure and the same mesa angle construction thus the responsivity can be adjusted according to the application.